## Improving IT Decisions with Enterprise Architecture

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# English Summary

One of the often mentioned applications of enterprise architecture (EA) is decision-making support. EA is considered as a function that enables senior management to take ownership of the key decisions on the design of the future organization. However, little is known about how EA has improved decisions. In this thesis we want to find evidence to what extent EA is indeed a useful instrument for supporting decision-making and in what way this support can take place. We therefore researched the relations between various aspects of the EA function and various aspects of the IT decision. Different research methods were used such as systematic literature study, case study, survey, experiment, focus group, and statistical analysis.

The results of this thesis indicate that the involvement of the EA function in IT decisions, and in particular in IT investment decisions is still low. We also found that the maturity of the EA function has a weak positive relationship with the quality of outcomes of IT investment decisions where this relationship is almost perfectly mediated by the quality of IT investment decisions.

So the question is; does EA matter? Yes, it does, but it depends on the way EA is performed.

The three organizations that participated in a multiple case study were satisfied about the contribution of the EA function in the decision support to resolve specific issues. This contribution however varied considerably from case to case. The variances in contribution can be explained by the differences in the decision-making context of each of the issues. The decision-making context apparently influences the role of the enterprise architect to a large extent. This finding was confirmed by studying two specific decision-making context elements in a case study, namely, the kinds of linkages between decisions and the movement to agile software development. We identified three types of linkages that apply to real life situations and found that each type of linkage requires a different role from EA. Sequential linkages require a high level design, precursive linkages require anticipating guidance and lateral linkages require a devil's advocate. The movement to agile software development changes the decision-making context for architects. Decision-making becomes more of a group effort where architects and stakeholders have to work together to make decisions. Architects are challenged to become team players, to make design decisions only when they are necessary, and finally, to document, communicate, and share design decisions more effectively. We conclude that the better the enterprise architect understands the decision-making context, the higher his or her impact on IT decisions.

A comparison between organizations with the highest quality of the outcomes of IT investments (top performers) compared with organizations with the lowest quality of the outcomes of IT investments (bottom performers) reveals that the former organizations have a more mature EA function across the board. Fur-

thermore top performers use more diagnostic and actionable EA artifacts in the preparation of IT investment decisions and, as a likely consequence, EA provides more strategic insights in the preparation of IT investment decisions, like whether the IT investment fits with business strategy and the relationships with past and future investments. When applied correctly, EA can contribute to better IT decisions.

To extend our research with a practical tool we developed a checklist that can be used by enterprise architects to support IT investment decisions, and more specifically, the business case. The added value of the checklist was evaluated by means of an experiment. The results of the experiment demonstrate that using a checklist as such does not make the difference. This confirms the conclusion that the enterprise architect him- or herself is the most important success factor in the use of enterprise architecture as management tool.

Our research provides relevant insights for both scientists and practitioners. The most important scientific contribution is the insight that EA is still an art. EA's success in IT decision-making depends to a large extent on the skills and competencies of the enterprise architect. EA practitioners learn that their success depends on their understanding and anticipation of the IT decision-making context which they are part of.

Given the increasing use of technology, the associated high investments, and the growing complexity, a solution is highly necessary to make the right investments and mitigate the risks of these investments. The EA function can be an important ingredient of that solution. However, it is a young discipline. With this research we hope to have contributed to EA being suited for and considered as being a management tool.